

# INTERNATIONAL SEARCH REPORT

International Application No.  
CT/EP 03/13983

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C22B1/10 C22B5/14 C22B34/12 F27B15/02 F27B15/10  
B01J8/18 C21B13/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 C22B F27B B01J C21B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

WPI Data, EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1 502 576 A (TITANIUM TECH LTD) 1 March 1978 (1978-03-01) claims 1-5; example II	1,11
A	VIJAY P L ET AL: "PREOXIDATION AND HYDROGEN REDUCTION OF ILMENITE IN A FLUIDIZED BED REACTOR" METALLURGICAL AND MATERIALS TRANSACTIONS B: PROCESS METALLURGY & MATERIALS PROCESSING SCIENCE, THE MATERIALS INFORMATION SOCIETY, US, vol. 27B, no. 5, 1 October 1996 (1996-10-01), pages 731-738, XP000632260 ISSN: 1073-5623 page 732; figures 1,5,6,8; tables V,VI --- -/-	1,7-11

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

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- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
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Date of the actual completion of the international search

3 May 2004

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12/05/2004

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Bombeke, M

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 4 676 824 A (HIRSCH MARTIN ET AL) 30 June 1987 (1987-06-30) column 4, line 35 -column 5, line 20; figure 1	33-37
A	column 2, line 12 - line 50 ----	2-4
X	US 3 578 798 A (LAPPLE WALTER C ET AL) 18 May 1971 (1971-05-18)	28-32
A	column 1, line 65 -column 2, line 75; figures 1,3 column 4, line 26 - line 44 ----	5
X	US 2 607 666 A (MARTIN HOMER Z) 19 August 1952 (1952-08-19) figure 1 ----	28-30
Y	US 4 789 580 A (HIRSCH MARTIN ET AL) 6 December 1988 (1988-12-06)	33-37
A	abstract; figure 1 ----	1,11
Y	US 4 044 094 A (BARNER HERBERT E ET AL) 23 August 1977 (1977-08-23) figures 3-5,7 ----	33-37
Y	US 5 603 748 A (HIRSCH MARTIN ET AL) 18 February 1997 (1997-02-18) column 7 -column 8; figure 1	33-37
A	column 3, line 22 - line 59 ----	2-4
Y	US 6 110 413 A (CHOI NAG JOON ET AL) 29 August 2000 (2000-08-29) figures 1-3 -----	33-37

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International Application No

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Patent document cited in search report		Publication date	Patent family member(s)	Publication date
GB 1502576	A	01-03-1978	AU 504225 B2	04-10-1979
			AU 1797276 A	06-04-1978
			BE 847207 A1	31-01-1977
			CA 1077239 A1	13-05-1980
			DE 2644581 A1	28-04-1977
			FR 2328048 A1	13-05-1977
			IT 1069022 B	21-03-1985
			JP 52049997 A	21-04-1977
			NL 7611451 A	19-04-1977
			NO 763518 A ,B,	19-04-1977
US 4676824	A	30-06-1987	DE 3428782 A1	13-02-1986
			AU 572324 B2	05-05-1988
			AU 4574385 A	06-02-1986
			BR 8503668 A	06-05-1986
			CA 1244653 A1	15-11-1988
			CN 85104824 A ,B	17-12-1986
			DE 3562491 D1	09-06-1988
			EP 0171097 A1	12-02-1986
			IN 162716 A1	02-07-1988
			PH 23688 A	27-09-1989
			ZA 8505861 A	29-04-1987
US 3578798	A	18-05-1971	NONE	
US 2607666	A	19-08-1952	US 2582710 A	15-01-1952
US 4789580	A	06-12-1988	DE 3540541 A1	21-05-1987
			AU 588647 B2	21-09-1989
			AU 6513486 A	21-05-1987
			BR 8605633 A	18-08-1987
			CA 1266368 A1	06-03-1990
			DE 3662700 D1	11-05-1989
			EP 0222452 A1	20-05-1987
			GR 88300159 T1	08-03-1989
			GR 3000079 T3	31-10-1990
			IN 166635 A1	30-06-1990
			NO 864490 A ,B,	18-05-1987
			NZ 217937 A	27-07-1989
US 4044094	A	23-08-1977	AU 503630 B2	13-09-1979
			AU 8421675 A	24-02-1977
			CA 1050281 A1	13-03-1979
			DE 2537940 A1	11-03-1976
			FR 2283235 A1	26-03-1976
			GB 1510026 A	10-05-1978
			JP 51050203 A	01-05-1976
			ZA 7505336 A	28-07-1976
US 5603748	A	18-02-1997	DE 4320359 C1	20-10-1994
			DE 4410093 C1	09-03-1995
			AU 673921 B2	28-11-1996
			AU 6479594 A	22-12-1994
			DE 59403432 D1	28-08-1997
			DK 630975 T3	01-09-1997
			EP 0630975 A1	28-12-1994
			TT 4894 B	16-06-1994
			US 5527379 A	18-06-1996

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 03/13983

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5603748	A	US 5560762 A	01-10-1996
US 6110413	A	29-08-2000	
		KR 276339 B1	15-12-2000
		AU 706405 B2	17-06-1999
		AU 5344098 A	17-07-1998
		BR 9707602 A	27-07-1999
		CA 2247152 A1	02-07-1998
		CN 1211283 A , B	17-03-1999
		CZ 9803022 A3	11-08-1999
		EP 0914477 A1	12-05-1999
		JP 11504393 T	20-04-1999
		JP 3185058 B2	09-07-2001
		WO 9828449 A1	02-07-1998
		RU 2158769 C2	10-11-2000
		SK 111598 A3	07-05-1999
		TW 387014 B	11-04-2000
		ZA 9711487 A	01-07-1998